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ATTACHMENT TO
FULLY EXECUTED ECONOMIC IMPACT STATEMENT
December 4, 2017

A. ESTIMATED PRIVATE SECTOR COST IMPACTS

2. Estimated economic impact.

California's Energy Code is part of the California Building Construction Standards and therefore not subject to review and approval by the Office of Administrative Law and therefore do not trigger the Standardized Regulatory Impact Assessment requirement.

3. Number of businesses impacted.

California's Energy Code is part of the California Building Construction Standards and therefore impacts nearly all newly constructed buildings, as well as to specific additions and alterations to nearly all existing buildings. Therefore, the Energy Code may eventually impact all business and individuals in the state that own buildings. We are unsure exactly how many such "businesses" are in California at any single point in time.

4 and 6. Number of businesses and jobs created and eliminated.

The proposed Energy Code measures are cost effective over the life of the measure.[1] Increased energy efficiency in California's buildings will have short term initial costs, but long term benefits from reduced utility costs. For individuals this will result in increased disposable income and for businesses lower costs and (most likely) additional profit. The following industries are the most positively impacted by increased energy efficiency, renewable generation and demand response[2]:

- Residential Building Construction (NAICS 2361)
- Nonresidential Building Construction (NAICS 2362)
- Electrical Contractors (NAICS 23821)
- Plumbing, Heating, and Air-Conditioning Contractors (NAICS 23822)

[1] For the first time the Energy Commission is proposing to adopt and indoor air quality Standard as health and safety Standard that is not demonstrably cost effective. Public Resources Code section 25402.8 states: "When assessing new building standards for residential and nonresidential buildings related to the conservation of energy, the commission shall include in its deliberations the impact that these standards would have on indoor air pollution problems."

[2] The University of California, Berkeley "California Workforce Training and Needs Assessment for Energy Efficiency, Distributed Generation and Demand Response." See Table 3.10 et seq., pages 69-75, http://www.irle.berkeley.edu/vial/publications/WET_Part1.pdf.

- Drywall and Insulation Contractors (NAICS 23831
- Manufacturing (NAICS 32412, 3279, 3332, 3334, 3336, 3341, 3342, 3344, 3345, 3351, 3352, 3353, 3359 (part))
- Advertising and Related Services (NAICS 5418)
- Engineering Services, Architectural Services, Environmental Consulting Services, Other Scientific and Technical Consulting Services (NAICS 541 (part))
- Management of Companies and Enterprises, Public Administration (NAICS 5511, 92 (part))
- Office Administrative Services (NAICS 5611)

It is unclear how many aggregate businesses and jobs will be created based on the marginal impact from the implementation of the proposed Energy Code. All CASE Reports include a market impact analysis. However, that analysis varies in quality and comprehensiveness. Below are example excerpts from the market analysis of selected measure proposals having the most notable impact on residential building costs.

Residential Rooftop PV Measure Analysis[3]: In addition to California manufacturers, there are a large number of PV wafer, cell, and module manufacturers headquartered and manufacturing in other countries. The proposed measure, if adopted, would result in the addition of approximately 200 MW of distributed solar PV per year in California, which would not substantially impact the global supply chain.

California has a robust solar industry. About 1.2 GW of these California small scale PV systems were installed in the previous year, well above the estimated 200 MW annual installations associated with the proposed measure. California's firmly established and growing solar industry in conjunction with the certainty and preparation time inherent to this proposal secure the feasibility of this proposal.

The conclusion to be drawn on the employment benefits of this proposed code change are:

1) The addition of rooftop solar to new residences will increase solar industry jobs, by creating direct construction, installation and maintenance jobs, as well as module and supply chain employment and employment in non-solar sectors.
2) Macroeconomic employment impacts, which account for potential rate increases and displacement of jobs in other electricity generation segments, are unclear. They may be positive or negative.

[3] See pages 17, 22 and 24 in TN# XXXXX (provide link once docketed)

Recent increases in solar PV installations have been accompanied by the emergence of a significant number of Californian jobs and businesses throughout the solar value chain. Solar businesses can be expected to expand and new businesses open, as solar installations increase under the proposed Standard. Since the majority of solar jobs in California are for on-site installation, which requires labor local to each PV site, at least some of these business additions can be expected to be geographically spread across the state.

Existing businesses that may be eliminated as a result of the proposed Standard are those that currently provide electricity generation for homes that will be replaced by new construction with solar PV after the Standard goes into effect. Note that homes built to house new California residents represent new energy demand, and therefore will not displace, to a significant degree, existing electricity generation or cause elimination of any existing businesses. Since the state's investor-owned utilities' revenues are decoupled from volumetric energy sales, the financial impact on these companies is expected to be minimal.

Residential Quality Insulation Installation (QII) Measure Proposal[4]: Insulation contractors are the key players in QII and ensuring quality installation of insulation. Insulation installers must install insulation products to meet manufacturers specifications and according to QII criteria. There are no required technological advances necessary to meet QII criteria. The challenges are with proper installation practices.

QII has been included as a compliance credit in the Title 24, Part 6 Standards since 2005. Implementation is not widespread, but it is commonly taken as a compliance credit in new construction. According to CalCERTS registry data between January 2015 and April 2016, an estimated 24 percent of registered single family projects and 13 percent of registered multifamily projects took the QII credit.

Market actors will need to invest in training and education to ensure the workforce, including those working in construction trades, know how to comply with the proposed requirements. Workforce training is not unique to the building industry, and is common in many fields associated with the production of goods and services. Costs associated with workforce training are typically accounted for in long-term financial planning and spread out across the unit price of many units as to avoid price spikes when changes in designs and/or processes are implemented.

[4] See page 7, 8, 10 and 12 of TN#XXXXX (provide link)

The proposed measure results in an expected increase in labor hours of 2.0 hours per "typical" single family home and 1.0 hours per multifamily dwelling unit (based on the prototype buildings applied in this analysis). HERS Rater labor hours are estimated at four hours per single family home and 0.75 hours per multifamily dwelling unit. On a statewide basis, assuming 100 percent of new projects use QII for compliance and accounting for the current percentage of projects already building with QII, this corresponds to an increase in construction employment by 107 full time employees and an increase in HERS Rater employment of 216 full time employees.

B. ESTIMATED COSTS

1. What are the total statewide dollar costs that businesses and individuals may incur to comply with this regulation over its lifetime?

The amount listed on line 1 of $2,170,151,362 is coincident with the total on the Summary worksheet sheet of the 2019 Form 399 Calculations spreadsheet. This value is the sum of the residential and nonresidential measures costs for all newly constructed buildings, additions and alternations for 2020. The question specifies the "lifetime of the regulation," and these regulations are expected to have an extended lifetime. Staff considered and rejected interpreting the "regulation over its lifetime" to mean three to five years, which is the cycle of regular updates to the Energy Code, and instead opted to provide annual data. The life expectancy for residential and nonresidential buildings is assumed to be 30 years. For mechanical and electrical equipment in nonresidential buildings and outdoor lighting the life expectancy is assumed to be 15 years.

1(a, b) Initial costs for a small business and initial costs for a typical business.

The Energy Codes does not differentiate between a small business and a typical business but rather impact construction that may occur in nearly all public and private buildings in California. To provide this estimate, we calculated a weighted per square foot cost based on the proposed changes to the Energy Code, the types of nonresidential buildings the Energy Code would be applied to, and the estimated newly constructed buildings by nonresidential building type from 2012 through 2020. We then applied this weighted average cost per square foot ($.69) to a hypothetical 15,000 square foot generic nonresidential building. This weighted average reflects a range of cost per square foot values from $.15 to $4.87 for 13 standard nonresidential building types across all 16 Energy Code climate zones. Staff calculated the cost impact of the proposed Energy Code from additions and alterations activity using a multiplier estimate based on the ratio of dollar activity of commercial newly constructed buildings to commercial additions and alterations provided by the California Industrial Relations Board (see CIRB Statewide Nonresidential worksheet in the 399 Excel file). The additions and alternations cost is included in the statewide total dollar costs, but that cost is not reflected in the small business or typical business initial

costs. The initial costs associated with the proposed Energy Code for newly constructed buildings will be substantially higher than the initial costs for additions and alterations in existing nonresidential buildings. To make a conservative estimate of the cost to a "typical business," the cost per square foot estimate was applied to a scenario that a "typical business" uses a 15,000 square foot newly constructed building. It should be noted that, assuming nonresidential construction costs average $150 per square foot, the additional costs from the proposed Energy Code will increase the cost of the building by approximately 0.46%.

1(c) Initial costs to an individual.

The initial cost to an individual of $10,537 is based on the increased single family house average cost, which ranges, depending on climate zone it is built in, between $8,952 and $18,589[5] for a prototype single family home. The value listed in the summary is a weighted average for the single-family newly constructed buildings estimated for 2020. Low-rise multifamily buildings (those with three or fewer habitable stories) are subject to the residential Energy Code; however, the costs of residential construction impacts ownership entities not individual tenants directly. If low-rise multifamily residential units are considered in the calculation, the average initial cost for an individual would be $9,247. Staff calculated the cost impact of the proposed Energy Code from additions and alterations activity using a multiplier estimate based on the ratio of dollar activity of residential newly constructed buildings to residential additions and alterations provided by the California Industrial Relations Board (see "CIRB Statewide Residential" worksheet in the "2019 Form 399 Calculations.xlsx" file). The costs of residential additions and alternations are included in the statewide total dollar costs, but are not reflected in the individual initial costs. The initial costs associated with the proposed Energy Code for newly constructed buildings will be substantially higher than the initial costs for additions and alterations to existing residential building.

4. **Will the regulation directly impact housing costs?**

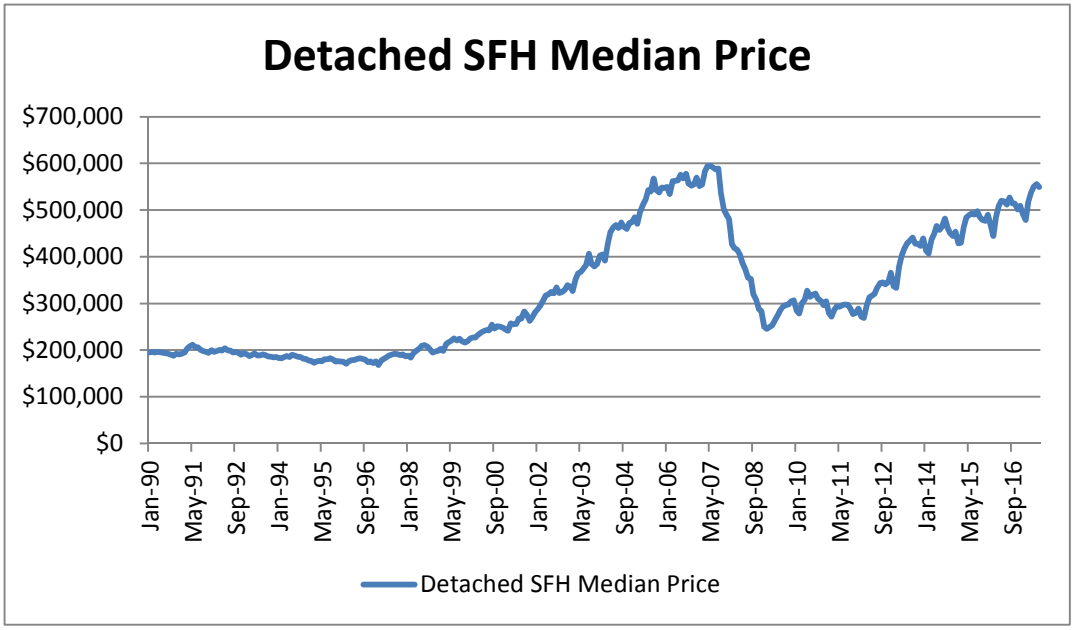
The $9,247 value listed here is the average initial cost per housing unit (single family and low-rise multifamily) of estimated newly constructed housing in 2020. The number of housing units listed at 164,741 is represents the total estimated 117,070 single family homes and the 47,671 low rise multifamily units of newly constructed housing for 2020.

[5] Note that the $18,589 cost is an outlier reflecting costs for Climate Zone 15 which encompasses the southern California desert regions. The next highest cost is $13,234.

Average median single family home monthly inflation has been approximately $2,300 for the past three years.[6] Based on this, our assessment is that the proposed 2019 Energy Code will have the notably less impact on the housing market than 4-6 months of normal median family home price inflation, even assuming that all the costs associated with Energy Code are passed on to the home buyer. The Energy Commission believes the impact is notably less given that the Energy Code primarily impact newly constructed buildings and median family home sale price includes both new and existing home sales. Similarly, to the extent that single family home affordability impacts rental housing costs (i.e., the less affordable single family housing, the higher the cost of rents) the impact on rents will also be notably less than the impact of 4-6 months of median single family home price inflation.

California Single Family Home Prices: According to the California Association of Realtors (CAR), from January 2009 through December 2016 the statewide median detached single family home price went from $249,960 to $508,870. That is a 103% increase in the median detached single family home price. These numbers are bit skewed in that they cover the great recession. Looking at the same data set, the statewide median home price in January 1990 was $194,952, adjusted for CPI inflation that would equal $373, 090 or approximately $135,000 less than the current $508,870 statewide median home price. The chart below shows median detached single family home prices (in nominal $) from January 1990 through September 2016.

[6] This is the monthly average of a serious of rolling 12-month averages from January 2015 through July 2017. See “Median Price” worksheet in the “2019 Form 399 Calculations.xlsx” file.



Recent CAR data for 2016-2017 shows the same above inflation level increase in median home price. According to CAR from July 2016 to July 2017 the median sold single family home price increased 7.4% from $511,420 to $529,460. In some markets the increase during that same period was over 10%. None of that can be credibly blamed on changes in the building code, let alone changes in the Energy Code.

C. ESTIMATED BENEFITS

3. **What are the total statewide benefits from this regulation over its lifetime?**

The total statewide benefit listed on the Std 399 form is $ 3,871,153,274. This value is the sum of the time dependent energy valuation net present value energy savings for residential and nonresidential measures for all newly constructed buildings, additions and alternations for 2020. The question specifies the "lifetime of the regulation" and these regulations are expected to have an extended lifetime. Staff considered and rejected interpreting the "regulation over its lifetime" to mean three to five years, which is the cycle of regular updates to the Energy Code, and instead opted to provide annual data. The life expectancy for residential buildings measures is assumed to be 30 years. The life expectancy for residential and nonresidential buildings is assumed to be 30 years. For mechanical and electrical equipment in nonresidential buildings and outdoor lighting the life expectancy is assumed to be 15 years.

D. ALTERNATIVES TO THE REGULATION

1. List alternatives considered and describe them below. If no alternatives were considered, explain why not:

For more than thirty-five years, legislative enactments and state energy policies have directed the Energy Commission to adopt cost-effective building standards to improve energy efficiency and thereby improve the state's economy, energy security, and environment.[7] At this time the Commission is not aware of alternatives to the proposed regulations that would be more effective than the proposed regulations in achieving the energy-efficiency goals of these directives, or that would be equally effective and have a lower adverse impact on small businesses (or on any other economic interests). However, it is quite likely that during the course of the rulemaking, the Commission will receive comments that are helpful in improving the proposed Energy Code. Moreover, during the initial, informal stage of the rulemaking process, the Commission conducted an extensive public process considered many suggestions from stakeholders about (1) alternatives that could improve the feasibility of the Commission's preliminary versions of the proposed regulations or could reduce their adverse impacts; (2) the technical and cost-effectiveness analyses of those preliminary proposals; and (3) the language in those proposals. The main suggestions and the Commission's responses are discussed in the Initial Statement of Reasons.

3. Briefly discuss any quantification issues that are relevant to a comparison of estimated costs and benefits for this regulation or alternatives:

Because the Energy Code is fundamentally performance-based there are multiple options and multiple "pathways" to meeting the Energy Code. Given the plethora of available options the Energy Commission chose the most cost effective to present in this analysis.

E. MAJOR REGULATIONS

4. Will the regulation subject to OAL review have an estimated economic impact to business enterprises and individuals located in or doing business in California exceeding $50 million in any 12-month period between the date the major regulation is estimated to be filed with the Secretary of State through 12 months after the major regulation is estimated to be fully implemented?

The proposed Energy Code is not subject to Office of Administrative Law review. The Energy Code is part of the California Building Construction Standards and therefore not subject to review and approval by the OAL and therefore do not trigger the Standardized Regulatory Impact Assessment requirement.

[7] See Public Resources Code sections 25007 and 25402(a)(1), (a)(3), & (b)(3); 2016 Integrated Energy Policy Report Update (http://docketpublic.energy.ca.gov/PublicDocuments/16-IEPR-01/TN216281_20170228T131538_Final_2016_Integrated_Energy_Policy_Report_Update_Complete_Repo.pdf).

FISCAL IMPACT STATEMENT

A. FISCAL EFFECT ON LOCAL GOVERNMENT

2 and 3. Additional expenditures and savings.

Current fiscal year is assumed to be 2020, the first year the Energy Code will be in effect. Data on local government existing building stock is very limited, as is data on proposed local government building construction. Only local government owned buildings, not leased buildings, are relevant to these calculations. These expenditures and savings values were calculated based on an estimate that 6 percent of the total costs of nonresidential newly constructed buildings, additions and alterations to existing buildings, would apply to local government. Based on these assumptions the expenditures per year in line 2 are estimated at $13.345 million while the net present value annual savings are estimated on line 3 at $1.643 million (estimated net present value savings divided by 30).

A. FISCAL EFFECT ON STATE GOVERNMENT

1 and 2. Additional expenditures and savings

These expenditures and savings values were calculated based on an estimate that three percent of the total costs of nonresidential newly constructed buildings, additions and alterations to existing buildings, would apply to state government. The three percent figure is based on the rough (under-reported) estimate of over 12,000 buildings owned by the state and the estimated ~600,000 commercial buildings in California. Based on these assumptions the expenditures per year in line 2 are estimated at $6.677 million while the net present value annual savings are estimated on line 3 at $.822 million (estimated net present value savings divided by 30).

C. FISCAL EFFECT ON FEDERAL FUNDING OF STATE PROGRAMS

4. Other. Explain:

State agencies that are reimbursed for utility costs by the Federal Government may have reduced utility costs and therefore have lowered Federal reimbursements reflecting those lowered utility costs.